was carried out after IERB approval. Total of 120/157 patients 30 each, 56-58 yrs old, with diagnosis of knee OA, Grade – II / III were randomized to receive total dose of – placebo 800 mg, NRINF02 (*Curcuma longa linn.*-standardized extract) 500 mg and GS 1500 mg and their combination orally, for 42 days with follow-up on 21st and 42nd day. Primary efficacy outcomes were measured using WOMAC, Visual Analogue Scale [VAS], Clinician Global Impression of Change [CGIC] and clinical-examination and secondary efficacy outcome by recording number of paracetamol tablets as rescue medication. Safety profile was monitored at each clinic visit by recording adverse reactions. Chi-square test, repeated measures ANOVA and mixed model analysis were performed using SPSS 16.0 and presented as inferential statistics. **RESULTS:** Patients on NRINF02 showed significant decrease in - WOMAC = $p < 0.05$, VAS = $p < 0.05$, CGIC = $p < 0.001$, used lesser number of rescue medications($p < 0.05$) and demonstrated greater clinical and subjective improvement compared to placebo group. All study medications demonstrated acceptable safety profile. **CONCLUSIONS:** Study patients exhibited acceptable tolerability and efficacy profile with NRINF02 when assessed using algofunctional indices for OA. NRINF02 may therefore be considered as an alternative treatment option in patients intolerant to NSAIDs presenting with uncomplicated knee OA.

PMS6

DISEASE BURDEN OF RHEUMATOID ARTHRITIS IN MAINLAND CHINA: A SYSTEMATIC REVIEW AND META-ANALYSIS

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OBJECTIVES: To conduct a systematic review to estimate the disease burden of Rheumatoid Arthritis in Mainland China. **METHODS:** Publications between 1990 and 2010 were systematically searched from 10 electronic databases. Observational studies consisting of disease burden of Rheumatoid Arthritis were included. Data were extracted using a standardized form. Quality of searched publications was evaluated by the quality rating scale. Meta –analysis of prevalence rates was conducted using the generic inverse variance model. Meta-analysis of SF-36 quality of life scores were performed to assess 8 dimensions by RevMan5.0 software, with weighted mean difference (WMD) used as the indicator of intervention effect. Sensitivity analyses were performed to evaluate the impact of different research qualities. **RESULTS:** In total, 20 studies were included, which general quality was evaluated as moderate. The weighted prevalence was 0.42%(95%CI□F0.39%-0.45%). The weighted prevalence in females was significantly higher than that in males. But there was no statistically significant difference on different periods, or between the southern and northern sections of Mainland China. The meta-analysis showed that there was a statistically significant difference between WMD of the 8 dimensions of the SF-36. Sensitivity analysis showed that the weighted results were stable. The incidence rate of RA was 14.7/100 000. In some studies, it is estimated that there was 4.92 healthy life year per patient lost in his life resulting from RA. **CONCLUSIONS:** The prevalence of RA in Mainland China is similar to that of western countries. Considering the high disability risk of RA, additional economics burden studies, especially indirect burden studies, will be helpful for enhance the awareness of RA and to provide patients treatment options and support.

MUSCULAR-SKELETAL DISORDERS - Cost Studies

PMS7

THE MEDICATION COSTS OF RHEUMATOID ARTHRITIS - COMPARING BEFORE AND AFTER INTRODUCTION OF THE BIOLOGICS

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OBJECTIVES: Rheumatoid arthritis (RA) is a chronic, autoimmune inflammatory disease imposing a great burden on individuals and society, highlight by the introduction of new expensive biologics within this decade. This study compared the trend of health care expenditures and biologics costs due to rheumatoid arthritis from 1999-2009. **METHODS:** This study was based on data from the National Health Insurance Research Database (NHIRD) released by the National Health Research Institute, which representing 99% of the entire population of Taiwan. We identified all patients by both with a primary diagnosed code ICD-9-CM 714.0 and with RA Catastrophic Illness certificate. Patients who fulfilled the American College of Rheumatology criteria for the classification of RA are qualified to register in Catastrophic Illness file and can benefit for waiving the outpatient registration fee. The indication for reimbursement the biologics were DAS28□a5.1 for two continuous measures 1 month apart in Taiwan. **RESULTS:** After adjusting by using WHO 2000 population, we found the incidence rate of RA is stable around 0.01% from 1999 to 2009 in Taiwan. However the prevalence rate is increasing from 0.07% to 1.13%. The average annual growth rates of total medication cost for RA patients (51.6%) are higher than the growth rates of total treatment cost for RA patient (36.7%) during the study period from 1999 to 2009. In addition, Outpatient drug cost growth rates (11.5%-44.1%) were much higher than that of inpatient drug growth rates (2.4%-26.7%) during this period. Enbrel was reimbursed by the National Health Insurance since 2003 and next year it reflected an 11.6% growth rate in expenditure. Although there are three biologics reimbursed by NHI for qualified RA patients, Enbrel dominates on the market. **CONCLUSIONS:** The introduction of biologics may benefit to the decreasing rate of inpatient admission and costs.

PMS8

THE MORTALITY AND COSTS FROM HIP, VERTEBRAL, WRIST AND OTHER FRACTURES AMONG POSTMENOPAUSAL WOMEN IN TAIWAN

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OBJECTIVES: To examine the mortality and medical cost during the first and second year following fractures among elder women by different age groups. **METHODS:** Using the inpatient and outpatient database of National Health Insurance to define new hip fracture (ICD9 code 820, 733.14), vertebral fracture (ICD9 code 805, 806, 733.13), wrist fracture (ICD9 code 813, 733.12) and other fracture (ICD9 code 807, 808, 810, 811, 812, 821, 823, 733.10, 733.11, 733.15, 733.16, 733.19) cases from 2006 to 2009. We divided age into ten groups between 50-100 years. The HR of mortality and the incremental costs compared to the population without any fracture history in each group were estimated by cox proportional survival model and generalized linear model. **RESULTS:** The HR of mortality after hip fracture in each group ranged from 19.67 to 1.43 while after vertebral fracture ranged from 5.60 to 1.11. The extra costs (in NTD) of hip fracture during first year in each group were NT$178 535, NT$158 831, NT$184 334, NT$190 206, NT$179 261, NT$160 565, NT$136 195, NT$136 194, NT$110 476, NT$41 194. In the second year, the extra costs of hip and clinical vertebral fracture were NT$221 036 and NT$135 912, respectively. **CONCLUSIONS:** Hip and vertebral fractures result in significant mortality and costs. These results indicate potential benefits from interventions aimed at reducing fracture incidences.

PMS10

HOSPITALIZATION COSTS AND THEIR PREDICTORS IN PATIENTS WITH RHEUMATOID ARTHRITIS IN URBAN CHINA

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OBJECTIVES: Rheumatoid arthritis (RA) is associated with poor quality of life and higher health care cost. This study aimed to assess the hospitalization costs of rheumatoid arthritis (RA) and to characterize predictors of these costs. **METHODS:** A total of 676 RA patients were randomly selected by stratified two-stage sampling from the China Basic Health Insurance database in 2009 and 2008. All information of patient demographic characters, clinical and costs were collected for the analysis. We used generalized estimating equations to examine potential predictors of the costs. **RESULTS:** Among 676 RA patients (mean age = 57.8 years; 75.2% female), The mean hospital length-of-stay was 19.4 days for RA patients with basic medical insurance for urban employees and 15.0 days for those patients with basic medical insurance for urban residents. The average inpatient cost was Chinese Yuan (CNY) 8521.5 (median:□□6608.7, IQR:□□4223.5-□□10383.3), higher than those without RA(CNY 7670) and the average drug cost accounts for 49.95% of the total cost (mean: □□5295.3). The multiple linear regressions showed that the hospital cost of patients with basic medical insurance for urban employees had 39.6% higher costs than those with basic medical insurance for urban residents($P<0.001$). Patients from tertiary hospitals had 97.8% higher costs than those from primary hospitals; ($P < 0.001$) and patients from municipalities had 46.0% higher costs than those from county-level cities($P < 0.01$). **CONCLUSIONS:** Patients with RA is associated with high hospitalization costs. Costs are now driven predominantly by the cost of drugs, primarily biologic agents. and sociodemographic characteristics such as types of health insurance and levels of hospitals also play an important role in determination of costs.

PMS11

THE INPATIENT COSTS AND THEIR PREDICTORS IN PATIENTS WITH ANKYLOSING SPONDYLITIS IN CHINA

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OBJECTIVES: Ankylosing spondylitis (AS) is associated with poor quality of life and higher health care cost. This study aimed to assess the inpatient costs of AS and to characterize predictors of these costs. **METHODS:** A total of 560 AS patients were randomly selected by stratified two-stage sampling from the China Basic Health Insurance database in 2009. All information of patient demographic characters, clinical and costs were collected for the analysis. We used generalized estimating equations to examine potential predictors of the costs. **RESULTS:** Among 560 AS patients (mean age = 55.7 years;57% female), The mean hospital length-of-stay was 15.2 days for AS patients with basic medical insurance for urban employees and 9.8 days for those with basic medical insurance for urban residents($P<0.001$). The average inpatient cost was RMB 8173.3 yuan (median:4368.7, IQR:2836.1-7399.7) and the average medical service cost accounts for 68.0% of the total cost (mean: 5560.5; median:2376.0, IQR:1395.0-3882.7). The multiple linear regressions showed that the patients from tertiary hospitals had 84.7% higher costs than those from primary hospitals ($P < 0.001$) , patients from the east area have 30.7% higher costs than those from the west area ($P < 0.01$), and patients from municipalities had 72.5% higher costs than those from county-level cities($P < 0.05$). **CONCLUSIONS:** Patients with AS is associated with high hospital costs. Costs are now driven predominantly by the cost of medical service, and sociodemographic characteristics such as regions and levels of hospitals also play an important role in determination of costs.

PMS12

COST IMPLICATION OF PRESCRIPTIONS IN PRIVATE AND PUBLIC HEALTH INSTITUTIONS IN BAYELSA STATE OF NIGERIA

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OBJECTIVES: To determine factors that are responsible for the cost differential between private and public health facilities through the assessment of the cost per day of managing six diseases in selected health facilities in Bayelsa State, Nigeria. **METHODS:** Prescriptions generated in three tertiary / public hospitals and three private hospitals for management of Malaria, Typhoid Fever, Essential Hypertension, Diarrhea, Pneumonia, and Rheumatoid Arthritis over a specified period were evaluated to determine direct cost of drugs. Questionnaires were used to obtain relevant data on staff wage bills, and utility bills. Data were analyzed to obtain the cost per day for each diagnosis, number of days pay required to pay for the treatment using the newly approved N18, 000.00 minimum wage by the Federal Government of Nigeria. **RESULTS:** Public facilities pay much higher wage bill; all facilities rely heavily on alternative power source; public facilities utilized lesser number of drugs and shorter duration; polypharmacy, co-morbidities, treatment duration and number of drug prescribed determine cost of treatment; treatment cost for all six disease conditions was generally higher in the private facilities; Hypertension was the most costly to treat at a total cost of N20,570 for 30days requiring 36.28 days pay to afford; malaria was cheapest to treat for N227 requiring 0.4 day pay; the cost of treatment of the selected diseases are high and unaffordable. **CONCLUSIONS:** Generally, costs of prescribed drugs were expensive in the private facilities. The costs of treatment were also generally not affordable when viewed from the point of globally accepted affordability standard. Therefore the need to make the cost of drugs cheaper for health care to be more affordable becomes imperative.

PMS13

COST-EFFECTIVENESS OF BIOLOGICAL TREATMENTS IN PATIENTS WITH RHEUMATOID ARTHRITIS IN TAIWAN

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OBJECTIVES: Patients with rheumatoid arthritis in Taiwan might receive lifelong reimbursement for biologics from the Bureau of National Health Insurance (BNHI) if they satisfied required criteria, which might have a significant impact on the annual budgets of the BNHI. The objective of this study was to analyze and compare the cost-effectiveness among existing reimbursed eleven possible combinations of biological treatment strategies, while under limited and lifelong treatment duration assumptions. **METHODS:** Under limited and lifelong treatment duration assumptions, Monte-Carlo simulation was used to compare the cost-effectiveness of eleven possible combinations of biological treatment (Adalimumab, Etanercept, and Rituximab) strategies in patients with active RA. Treatment duration assumptions, effectiveness and utility parameters for different biological treatment strategies were obtained from published papers. Direct medical and drug costs were estimated according to Taiwan's National Health Insurance fee schedule for 2011 and the National Health Insurance payment standard. Probability sensitivity analysis was applied after Monte-Carlo simulation. Incremental costs per quality-adjusted life-year (QALY) between the strategies were calculated. Both cost and effectiveness were discounted at the rate of 3.5%. **RESULTS:** There were differences between the results for limited and lifelong treatment duration assumptions. For limited treatment duration, stratagies with Adalimumab as the first line biologic (including Adalimumab only; Adalimumab followed by Rituximab; Adalimumab, Rituximab and Etanercept; Adalimumab, Etanercept and Rituximab; Etanercept, Adalimumab and Rituximab) were more cost-effective. For lifelong treatment duration, however, strategies with Etanercept as the first line biologic (including Etanercept only; Etanercept followed by Rituximab; Etanercept, Rituximab and Adalimumab; Etanercept, Adalimumab and Rituximab) were more cost-effective. **CONCLUSIONS:** From the Bureau of National Health Insurance point of view, there seems to be a difference in defining the more cost-effective strategy under the assumptions, however, the strategy using Etanercept as the first line biologic followed by Adalimumab and Rituximab was cost-effective under both assumptions.

PMS14

COST-EFFECTIVENESS ANALYSIS OF ETANERCEPT IN THE TREATMENT OF RHEUMATOID ARTHRITIS IN CHINA

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OBJECTIVES: Rheumatoid arthritis (RA) critically impair the quality of life of patients. Biologic treatments represent a therapeutic alternative for patients who failed non-biological disease-modifying antirheumatic drugs (DMARDs). Their high cost, however, is a challenge for clinicians and decision makers. The aim of this study was to assess the cost-effectiveness of biologic alternatives to treat RA currently available in China, from a societal perspective. **METHODS:** A decision analysis model was developed to simulate the clinical course of patients treated with Infliximab+methotrexate (MTX), Etanercept, Etanercept+MTX, Adalimumab and Adalimumab+MTX as first-line therapies, as well as associated costs over one-year period. Patients were treated for 1-year without discontinuation or switch due to the lack of efficacy or a major adverse event (AE). Effectiveness measures were proportion of patients achieving 20%, 50%, 70% improvement following the American College of Rheumatology (ACR20, ACR50 and ACR70) criteria. Costs included biologics, concomitant drugs, medical follow-up and side effects management. Clinical response of alternatives and administration costs were extracted from published literature, while drug costs were collected from National Development and Reform Commission databases of China. **RESULTS:** When compared with Infliximab+MTX, Adalimumab and Adalimumab+MTX, Etanercept is effective over other biologic treatments except in ACR70 2% less effectiveness compared with Infliximab+MTX. Etanercept is 56,179US$ less than Infliximab+MTX (the most costly alternative) and 30% more patients meet the ACR20 criteria regarding Adalimumab (the least effective alternative). When compared with Infliximab+MTX, Adalimumab and Adalimumab+MTX, Etanercept+MTX is dominant over other biologic in either ACR20, ACR50 and ACR70. **CONCLUSIONS:** Due to their lower costs and favorable effectiveness profile, Etanercept or Etanercept+MTX are both less costly and the most effective over other biologic treatments in the management of RA in China.

PMS15

AN ECONOMIC EVALUATION OF DENOSUMAB IN THE TREATMENT OF POSTMENOPAUSAL OSTEOPOROSIS IN A TAIWANESE SETTING

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OBJECTIVES: Denosumab has recently been adopted in the National Health Insurance (NHI) program as a therapy in treating and preventing osteoporosis and the reimbursed price for denosumab is NT$12,688. It is important to assess if denosumab represents good value of money. The aim of this study was to evaluate the potential cost-effectiveness of denosumab in the treatment of osteoporosis among postmonopausal women in Taiwan. **METHODS:** A Markov cohort model was adapted to estimate and costs per quality-adjusted life-year (QALY) gained of a 3-year denosumab treatment compared with no treatment and the current treatments, alendronate, ibandronate, raloxifene or zoledronate used in Taiwan. The model was populated with costs and epidemiological data for Taiwan and the patients fitted the model were corresponding to the patients in the "Fracture Reduction Evaluation of Denosumab in Osteoporosis every 6 Months" (FREEDOM) trial. One-way and probabilistic sensitivity analyses were conducted to assess parameter uncertainty. **RESULTS:** In the base-case analysis, denosumab was shown to be "cost saving" compared to alendronate, ibandronate, as well as raloxifene. The results remain robust regardless of whether GI event was presence or the annual drug cost of denosumab was set higher. In the base-case when denosumab was compared to zoledronate, the ICER was NT$1,248,366 per QALY gained. **CONCLUSIONS:** Based upon currently available data, denosumab is considered cost-saving compared with alendronate, ibandronate and raloxifene and was found to be cost-effective when compared with zoledronate.

PMS16

ECONOMIC EVIDENCE OF BIOLOGICS IN RHEUMATOID ARTHRITIS: A SYSTEMATIC REVIEW FOR SUPPORTING INFORMED DECISION OF BNHI

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OBJECTIVES: In November 2011, Center for Drug Evaluation completed the project which aimed to re-evaluate the currently reimbursed biologics for rheumatoid arthritis (RA), and to establish the evidence-based revision rules of reimbursed items covered by National Health Insurance (NHI). As part of the project, this study reviewed the cost-effectiveness of reimbursed biologics (etanercept, adalimumab and rituximab) and other non-reimbursed biologics for adult patients. **METHODS:** Electronic databases including PubMed, CEPS (Chinese Electronic Periodical Services) and CETD (Chinese Electronic Theses and Dissertation Service) were searched up to October 2011. A total of 130 articles were reviewed and 37 were identified. The SIGN 50 instrument was subsequently applied to assess the quality of evidence. To present the differences among studies, we summarized the cost-effectiveness of biologics for DMARD-IR (inadequate response to disease-modifying anti-rheumatic drugs) and TNF-IR patients (inadequate response to tumor necrosis factor-alpha inhibitors), respectively. **RESULTS:** For DMARD-IR patients, twenty cost-effectiveness analyses (CEAs), most of high quality, were included. In summary, two reimbursed biologics including etanercept and adalimumab were considered as cost-effective alternatives in most foreign insurers comparing with DMARDs. Combination therapies of biologics and methotrexate were cost-effective comparing with monotherapy of biologics. However, the findings were still inconsistent when comparing etanercept with adalimumab, For TNF-IR patients, 10 CEAs, most of high quality, were included. Overall, rituximab was considered cost-effective in most foreign insurers. **CONCLUSIONS:** Existing studies suggested that the reimbursed biologics were cost-effective alternatives in most foreign countries. Nevertheless the cost-effectiveness of technologies might vary across countries, because the health care setting, clinical pattern, characteristics of patients, and relative prices are difference in nature. A localized decision analytic model is still needed for more relevant and precise assessment. This review, however, limited by the research resource, provided only the preliminary evidence to inform the decision making.

MUSCULAR-SKELETAL DISORDERS - Patient-Reported Outcomes & Patient Preference Studies

PMS17

BURDEN OF ANKYLOSING SPONDYLITIS IN URBAN CHINA

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OBJECTIVES: To assess co-morbidity, quality of life (QOL), work/productivity loss, and medical resource utilization (MRU) in patients with Ankylosing Spondylitis (AS) in urban China. **METHODS:** Patients' self-reported data were collected from 2010 National Health and Wellness Survey (NHWS). This survey represents urban population 18 years and older. QOL was measured by the physical component score (PCS) and mental component score (MCS) of the Short Form-12 (SF-12). Loss of